

557, 828

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
23 December 2004 (23.12.2004)

PCT

(10) International Publication Number
WO 2004/111099 A1

- (51) International Patent Classification⁷: **C08F 220/04**, 222/02, 4/30 (74) Agent: MATSUMOTO, Takehiko; 25-6, Hannan-cho 1-chome, Abeno-ku, Osaka-shi, Osaka, 5450021 (JP).
- (21) International Application Number: PCT/JP2004/008506 (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (22) International Filing Date: 10 June 2004 (10.06.2004)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data: 2003-168212 12 June 2003 (12.06.2003) JP (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- (71) Applicant (for all designated States except US): NIPPON SHOKUBAI CO., LTD. [JP/JP]; 1-1, Koraibashi 4-chome, Chuo-ku, Osaka-shi, Osaka, 5410043 (JP).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): KANZAKI, Akihiko [JP/JP]; 9-10-301, Takashiro-cho, Suita-shi, Osaka, 5640024 (JP). HEMMI, Akiko [JP/JP]; 2-5-14-307, Zuiko, Higashiyodogawa-ku, Osaka-shi, Osaka, 5330005 (JP). FUJII, Yoshikazu [JP/JP]; 9-10-406, Takashiro-cho, Suita-shi, Osaka, 5640024 (JP). YAMAGUCHI, Shigeru [JP/JP]; 5-112-4, Koorigawa, Yao-shi, Osaka, 5810872 (JP).

Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: WATER-SOLUBLE POLYMER AND ITS PRODUCTION PROCESS AND USES

(57) Abstract: An object of the present invention is to provide: a water-soluble polymer which can exercise a high calcium-ion-binding ability and a high clay dispersibility even under circumstances where high-hardness water is used; and a process for producing such a water-soluble polymer with ease and good productivity. As a means of achieving this object, the water-soluble polymer according to the present invention has: (1) a calcium-ion-binding ability of not less than 470 mgCaCO₃/g and further a clay dispersibility of not less than 0.90 in a test liquid having a calcium concentration of 50 ppm in terms of calcium carbonate; or (2) a calcium-ion-binding ability of not less than 430 mgCaCO₃/g and further a clay dispersibility of not less than 0.70 in a test liquid having a calcium concentration of 100 ppm in terms of calcium carbonate.



WO 2004/111099 A1